Abstract Submitted
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Penetration of a relativistic plasma-generated ionization wave into a strong magnetic field[1] HAOTIAN MAO, KATHLEEN WEICHMAN, UCSD, ZHENG GONG, TODD DITMIRE, HERNAN QUEVEDO, UT Austin, ALEXEY AREFIEV, UCSD — We apply a strong magnetic field to modify the expansion of a relativistic high energy density plasma into a neutral gas environment. Energy transport during plasma expansion into neutral gas is enhanced relative to plasma expansion into vacuum via a long-lasting relativistic ionization wave launched by the sheath electric field of the expanding plasma, which may be undesirable for applications. In this work, we use 1D kinetic simulations to examine the impact of an applied magnetic field on the propagation of the ionization wave. We find that an experimentally relevant 100 T-level magnetic field is capable of stopping the ionization wave propagation. In addition, we will discuss the condition for the ionization wave to stop in terms of the physical scales associated with the ionization wave and the applied magnetic field.

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Haotian Mao
UCSD

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